**GTDs TRAINING MODULES – *SESSION #1***

**Material to the ISS**

The material needed by the ISS in order to teach the training module is listed below.

It is divided in to 3 sections “GTDs symptoms and epidemiology”, “GTDs prevention” and “Managing plant infected by GTDs”, the first section is the most important in order to teach the session #1, the other two are needed in order to have a better understanding of the subject and in order to be able to answer to some question by the students.

The contents are reported in form of a list, first the videos (they are easy and faster to get knowledge from) than the Technical Datasheets (they are generic and still easy to access) and last the Scientific Abstracts (they are the most difficult of the 3).

GTDs SYMPTOMS AND EPIDEMIOLOGY

* VIDEO MATERIAL

Video seminars (30 minutes long):

<http://www.winetwork-data.eu/en/video/symptoms_and_epidemiology_of_grape_trunk_diseases_sc_26.htm> (Video on GTDs symptoms and Epidemiology)

<http://www.winetwork-data.eu/en/video/scientific_overview_on_grape_trunk_diseases_sc_29.htm> (Scientific review on the GTDs, a short list of symptoms and a review on the management)

<http://www.winetwork-data.eu/en/video/fungal_trunk_diseases_a_global_threat_to_grapevine_health_sc_16577.htm> (Scientific review on GTDs, with all the different diseases and with some solution to counter those diseases)

* Technical Datasheets (TD)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_global_vineyard_strategy_to_prevent_gtds_sc_16486.htm> (TD on the management strategy of a vineyard in order to have a low incidence of GTDs)

<http://www.winetwork-data.eu/en/technical_articles/botryosphaeria_dieback_-_identification_and_management_gtd__sc_16066.htm> (TD on Botryosphaeria)

* Scientific Abstracts

<http://www.winetwork-data.eu/en/scientific_abstract/the_scientific_basis_for_a_more_efficient_control_of_gtds_from_nursery_to_vineyard_sc_16271.htm> (Results of the scientific litterature review made by the Winetwork Scientific Working Group (SWG) on Grapevine Trunk Diseases.)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_arthropods_vector_grapevine_trunk_disease_pathogens_sc_15440.htm> (Can arthropods be vector of the GTDs pathogens?)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_development_of_a_monoclonal_antibody_tas-elisa_assay_for_detection_of_phaeomoniella_chlamydospora_sc_15442.htm> (Development of a monoclonal antibody TAS-ELISA assay for detection of Phaeomoniella chlamydospora)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_fungal_trunk_pathogens_in_the_grapevine_propagation_process_potential_inoculum_sources_detection_identification_and_management_strategies_sc_13973.htm> (Fungal Trunk Pathogens in the Grapevine Propagation Process Potential Inoculum Sources, Detection, Identification, and Management Strategies)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_genes_expressed_in_grapevine_leaves_reveal_latent_wood_infection_by_the_fungal_pathogen_neofusicoccum_parvum_sc_13904.htm> (Genes Expressed in Grapevine Leaves Reveal Latent Wood Infection by the Fungal Pathogen Neofusicoccum parvum)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_the_status_of_botryosphaeriaceae_species_infecting_grapevines_sc_13906.htm> (The status of Botryosphaeriaceae species infecting grapevines)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_the_wood_discoloration_and_decay_in_grapevines_with_esca_proper_and_their_relationship_with_foliar_symptoms_sc_13898.htm> (The Wood discoloration and decay in grapevines with esca proper and their relationship with foliar symptoms)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_the_distribution_and_symptomatology_of_grapevine_trunk_disease_pathogens_are_influenced_by_climate_sc_13900.htm> (The distribution and symptomatology of grapevine trunk disease pathogens are influenced by climate)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_the_effects_of_grapevine_trunk_diseases_gtds_on_vine_physiology_sc_13905.htm> (The effects of grapevine trunk diseases (GTDs) on vine physiology)

GTDs PREVENTION

* VIDEO MATERIAL

Video seminars (30 minutes long):

<http://www.winetwork-data.eu/en/video/scientific_overview_on_grape_trunk_diseases_sc_29.htm> (Scientific review on the GTDs, a short list of symptoms and a review on the management)

<http://www.winetwork-data.eu/en/video/how_to_control_the_gtds_sc_16032.htm> (how to manage GTD, the different ways to fight and manage this disease)

<http://www.winetwork-data.eu/en/video/trichoderma_application_gtd__sc_16036.htm> (application of Trichoderma on pruning wounds)

<http://www.winetwork-data.eu/en/video/fungal_trunk_diseases_a_global_threat_to_grapevine_health_sc_16577.htm> (Scientific review on GTDs, with all the different diseases and with some solution to counter those diseases)

<http://www.winetwork-data.eu/en/video/double_pruning_technique_gtd__sc_16035.htm> (double pruning as a technique of prevention to the GTDs)

* Technical Datasheets (TD)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_global_vineyard_strategy_to_prevent_gtds_sc_16486.htm> (TD on the management strategy of a vineyard in order to have a low incidence of GTDs)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_trichoderma_application_to_protect_pruning_wounds_sc_16485.htm> (TD on the use of Trichoderma as a biocontrol agent on the pruning wounds, it is able to colonize a wound and prevents GTDs pathogens to infect it)

<http://www.winetwork-data.eu/en/technical_articles/hot_water_treatment_for_gtd_control_sc_13885.htm> (TD on the Hot Water Treatment, this is a treatment to the plant material resulting lethal for pathogen with minimal damage to the host.

* Scientific Abstracts

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_potential_use_of_chitosan_in_the_control_of_grapevine_trunk_diseases_sc_14325.htm> (use of Chitosan as a fungicide in the fight against GTDs pathogens)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_studies_on_the_effect_of_water_and_temperature_stress_on_grapevines_inoculated_with_eutypa_lata_sc_15437.htm> (GTD - Studies on the effect of water and temperature stress on grapevines inoculated with Eutypa lata)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_ability_of_pythium_oligandrum_strains_to_protect_vitis_vinifera_l_by_inducing_plant_resistance_against_phaeomoniella_chlamydospora_a_pathogen_involved_in_esca__sc_13970.htm> (Ability of Pythium oligandrum strains to protect Vitis vinifera L., by inducing plant resistance against Phaeomoniella chlamydospora)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_optimisation_of_time_of_application_of_trichoderma_biocontrol_agents_for_protection_of_grapevine_pruning_wounds_sc_13971.htm> (Optimization of time of application of Trichoderma biocontrol agents for protection of grapevine pruning wounds)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_various_fungal_communities_colonise_the_functional_wood_tissues_of_old_grapevines_externally_free_from_grapevine_trunk_disease_symptoms_sc_13978.htm> (Various fungal communities colonise the functional wood tissues of old grapevines externally free from grapevine trunk disease symptoms)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_control_of_eutypa_dieback_in_grapevines_using_remedial_surgery__sc_13876.htm> (Control of Eutypa dieback in grapevines using remedial surgery)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_influence_of_water_stress_on_botryosphaeriaceae_disease_expression_in_grapevines_sc_13891.htm> (Influence of water stress on Botryosphaeriaceae disease expression in grapevines)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_effects_of_grapevine_cultivar_rootstock_and_clone_on_esca_disease_sc_13890.htm> (Effects of grapevine cultivar, rootstock and clone on esca disease)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_hot_water_treatment_to_reduce_incidence_of_black_foot_pathogens_in_young_grapevines_grown_in_cool_climates_sc_13965.htm> (Hot water treatment to reduce incidence of black foot pathogens in young grapevines grown in cool climates)

MANAGING PLANT INFECTED BY GTDs

* VIDEO MATERIAL

Video seminars (30 minutes long):

<http://www.winetwork-data.eu/en/video/scientific_overview_on_grape_trunk_diseases_sc_29.htm> (Scientific review on the GTDs, a short list of symptoms and a review on the management)

<http://www.winetwork-data.eu/en/video/how_to_control_the_gtds_sc_16032.htm> (how to manage GTD, the different ways to fight and manage this disease)

<http://www.winetwork-data.eu/en/video/fungal_trunk_diseases_a_global_threat_to_grapevine_health_sc_16577.htm> (Scientific review on GTDs, with all the different diseases and with some solution to counter those diseases)

* Technical Datasheets (TD)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_insertion_of_wood_dowels_inoculated_with_trichoderma_spp_inside_grapevine_trunk_sc_16490.htm> (Technical datasheet on the insertion of wood dowels inoculated with Trichoderma spp. Inside the grapevine trunk)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_global_vineyard_strategy_to_prevent_gtds_sc_16486.htm> (TD on the management strategy of a vineyard in order to have a low incidence of GTDs)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_trunk_renewal_sc_16306.htm> (TD on trunk renewal, trunk renewal technique is used to reform a new trunk with a basal sucker.)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_copper_nanoparticles_sc_16483.htm> (TD on the injection of Copper-Nanoparticles into the trunk of an infected grapevine)

<http://www.winetwork-data.eu/en/technical_articles/technical_datasheet_trunk_cleaning_sc_16484.htm> (TD on the Trunk Cleaning or Curettage, this practice consists in the removal, with a chainsaw, of the infected portion of the trunk)

<http://www.winetwork-data.eu/en/technical_articles/winetwork_grapevine_trunk_diseases__sc_49.htm> (TD on the timely trunk renewal, this is a practice that aims to cut the trunk and to replace it with a sucker)

* Scientific Abstracts

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_first_studies_on_the_potential_of_a_copper_formulation_for_the_control_of_leaf_stripe_disease_within_esca_complex_in_grapevine_sc_15441.htm> (First studies on the potential of a copper formulation for the control of leaf stripe disease within esca complex in grapevine)

<http://www.winetwork-data.eu/en/scientific_abstract/gtd_-_preliminary_trials_on_treatment_of_esca-infected_grapevines_with_trunk_injection_of_fungicides_sc_13967.htm> (Preliminary trials on treatment of esca-infected grapevines with trunk injection of fungicides)

OTHER MATERIAL

* VIDEO MATERIAL SPECIFIC ON EUTYPA

A series of videos on Eutypa:

They were made in the Clear Valley in Australia, they are short videos focused on Eutypa, and they show the symptoms and some solution to this disease.

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_introduction_and_identification_video_1_of_10_gtd__sc_16087.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_monitoring_and_surveying_video_2_of_10_gtd__sc_16088.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_decision_making_video_3_of_10_part_1_gtd__sc_16089.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_decision_making_video_4_of_10_part_2_gtd__sc_16090.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_reworking_-_remedial_surgery_and_vineyard_hygiene_video_5_of_10_gtd__sc_16091.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_reworking_-_an_alternative_approach_video_6_of_10_gtd__sc_16092.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_reworking_-_vine_training_7_of_10_gtd__sc_16093.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_preventing_infection_-_pruning_measures_video_8_of_10_gtd__sc_16094.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_preventing_infection_-_fungicide_spraying_video_9_of_10_gtd__sc_16095.htm>

<http://www.winetwork-data.eu/en/video/managing_eutypa_dieback_-_the_old_days_video_10_of_10_gtd__sc_16096.htm>

Video clips (5 minutes long):

<http://www.winetwork-data.eu/en/video/grapevine_trunk_diseases_1_-_symptoms_and_epidemiology_sc_16518.htm> (GTDs symptoms and epidemiology, pictures of symptoms and an easy representation of a pathogen lifecycle)

<http://www.winetwork-data.eu/en/video/grapevine_trunk_diseases_2_-_how_to_prevent_the_infection_sc_16521.htm> (How to prevent the infection of GTDs, Painting the wounds with mastics or using Trichoderma, guyot poussard and pruning drills)

<http://www.winetwork-data.eu/en/video/grapevine_trunk_diseases_3_-_managing_infected_vines_sc_16522.htm> (how to manage GTDs, timely trunk renewal, Curettage, over-grafting, H2O2 Injections, use of Trichoderma dowels, Cu-nanoparticles injection)